White Paper

SAP and Business Intelligence

- *Intelligent Choices for ERP Data Access and Analysis*

BUSINESS OBJECTS®

Authors: Steve Jones
Mark Hammond

Contributors: Darren Cunningham
Elizabeth Poe

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Executive Summary

Chances are that SAP applications play a role in your enterprise. SAP's prowess at managing large volumes of transactional data has made it the leader in enterprise resource planning (ERP), a $21 billion market in 2002 that AMR Research expects to grow to $31 billion by 2006.[1] As of January 2003, SAP claims more than 56,000 installations of its software in more than 18,800 companies in over 120 countries. Yet despite their popularity, SAP applications in many organizations remain semi-isolated and untapped for the business intelligence (BI) they contain.

Companies worldwide have invested billions of dollars in SAP applications, as well as rival products from such vendors as Oracle, PeopleSoft, Siebel, J.D. Edwards, and others. These enterprise applications have helped to manage data and automate processes across the enterprise—finance, human resources, manufacturing, supply chain, customer relationship management, and others.

In the wake of these large expenditures, companies are looking to capitalize on their SAP investments. Applications based on SAP R/3, APO, CRM, and others contain a wealth of data that would be of enormous value—if that data was readily accessible for reporting and analysis by users across the enterprise, and beyond.

Enter business intelligence. BI enables senior executives, business managers, operational staff, knowledge workers, and external business partners to access, analyze, and share information. It is the key to making faster, smarter business decisions that drive revenue, reduce spending, and build a competitive advantage. BI enhances the business value of nuts-and-bolts transactional data in SAP and other applications by enabling users to gain insights through analysis and reporting.

This white paper explores the choices available to organizations that wish to maximize the value of SAP and other application and legacy data through business intelligence. Topics range from basic reporting against SAP applications, to more sophisticated systems that capitalize on BI's ability to integrate data from multiple SAP and non-SAP sources. Users can then present that information in a standardized manner that is readily accessible for query and reporting by users at all levels throughout an organization. We outline a four-phase lifecycle process that covers:

1. **Direct Connection:** Rapid, tactical reporting against SAP applications
2. **Departmental Focus:** Data mart approach to reporting and analysis of SAP data by business or functional units
3. **Integrated Enterprise Analytics:** Cross-enterprise analytics on SAP and other application, e-commerce, and legacy sources
4. **Extended Access:** Leveraging SAP data through BI extranets to build collaborative relationships with suppliers, customers, and partners

We also examine the Business Objects solution for accessing, analyzing, and sharing SAP and non-SAP data. Founded in 1990, Business Objects is the worldwide leader in business

[1] AMR Research, news release, May 2002.

intelligence, with more than 17,000 customer sites in 80 countries. Business Objects provides an end-to-end solution for SAP:

- **Data integration:** BusinessObjects™ Data Integrator provides deep native access to SAP applications with batch and real-time data movement; prebuilt, function- and source-specific packaged data marts deliver rapid time to value.
- **Query, reporting, and analysis:** The market-leading BI platform from Business Objects provides a robust, easy-to-use interface for users at all levels of an organization, and its business partners.
- **Integrated analytics:** BusinessObjects Analytics comprises four analytic applications to track customer, supply chain, product and service, and operations activity—and link the processes through the standardized BusinessObjects Application Foundation analytic framework.
- **Advanced access and delivery:** The BusinessObjects InfoView portal delivers personalized BI content. BusinessObjects Broadcast Agent accelerates decision-making with alerts to email, web, and wireless devices.
- **Value-add to SAP BW:** Business Objects extends the value of SAP Business Information Warehouse (SAP BW) with robust functionality and ease of use through SAP BW optimized analytic interfaces.
- **Enterprise Portal integration:** Business Objects provides integration to SAP's suite of Enterprise Portal products via the Open Portal Initiative (OPI). The OPI is a structured program whereby integration components are developed for leading Enterprise Portal vendors, such as IBM, Oracle, Microsoft and, of course, SAP.

Finally, we highlight the successes that customers such as Maxtor, a leading risk insurance company, Unilever, Owens & Minor, and BOC Gases have realized in using the Business Objects solutions to gain business insights from SAP and other operational data.

Unlocking SAP Data for Competitive Advantage

"Mission-critical as it is, the information stored in ERP applications and transactional systems has for the most part not been liberated and exploited for the intelligence that it holds."

Bernard Liautaud
Chairman and Chief Executive Officer, Business Objects
"e-Business Intelligence: Turning Information into Knowledge into Profit"

Today's business climate is characterized by the desire of business and IT executives and managers to realize value from IT investments. Spendthrift days of irrational exuberance are in the past. More than ever, it's strategic thinking and bottom-line ROI that drives decisions on which technologies are deployed where.

Despite the economic downturn, companies view BI as a strategic weapon that can help them achieve competitive advantage, differentiation, and ultimately, ROI. In a November 2002 study based upon 540 interviews with IT and business professionals in the U.S. and Europe, Gartner, Inc. reported that 62% of companies would increase BI spending in 2003.

In particular, Gartner found that, companies look to BI "to deliver value from enterprise applications such as enterprise resource planning (ERP) and customer relationship management … Most of the participants in our study said they see BI as a strategy."[2]

Similarly, a December 2002 META Group presentation reports that business users remain challenged by ERP applications' data access and analytic capabilities. As a strategic business initiative, META Group said that, BI projects for ERP "stand to offer 'breakaway' competitive advantage."[3] META Group identified as the top 10 business drivers for adopting BI for ERP:

1. Provide operational information as quickly as possible to business users
2. Support decision-making in real time, leading to action within the enterprise
3. Identify performance issues associated with financial processes
4. Monitor business activities to ensure optimal execution
5. Provide macro view of customer (supplier, employee, partner) information
6. Establish business activity monitoring processes based on exceptions and thresholds
7. Enable business partners and suppliers to access critical information to integrate business process decision-making within the supply chain
8. Improve responsiveness to events and activities that impact the business
9. Enable larger numbers of business users to be involved with a business process

[2] Gartner AV-18-5277, "Gartner's 2002 BI Market Study: How Do You Stack Up?" H. Dresner, November 2002.
[3] META Group, "Best Practices for ERP Business Intelligence Strategies: 2003/04," December 2002.

10. Drive down the shadow IT organizational costs associated with lack of rationalized enterprise analytic infrastructure and proliferation or unarchitected BI solutions

Enterprise objectives in coupling ERP with BI are clear enough—each of the business drivers identified by META Group bears on the bottom line. For instance, swiftly delivering operational information enables informed decisions on how to finely-tune manufacturing or logistics schedules to synchronize with fluctuations in sales, inventory, or supplier delivery of goods. Similarly, analysis of sales, marketing, and customer behavior data enables an organization to identify and execute on new revenue opportunities.

With a BI system that enables such decisions to be made in a systematic and sustainable manner, decisions on cost reduction and revenue enhancement add up over weeks and months to constitute a substantial bottom-line benefit.

The Unique Challenges of SAP

Implementing a BI platform in support of ERP applications from any vendor is not an overnight process. With SAP, the task is uniquely challenging.

As SAP developers and administrators are well aware, an SAP application may consist of more than 10,000 normalized system and data tables. Table names are rather cryptic and frequently use German abbreviations. Simply managing and customizing R/3 applications, for example, requires developers to have an advanced SAP-specific skill set.

Almost universally, companies have discovered that building a BI system for SAP can be complex, costly, and time consuming. Some challenges commonly cited include:

- "The SAP data schema is extremely complex and contains a large number of tables with cryptic names and unknown relationships."
- "Custom ABAP coding is expensive and difficult to maintain."
- "We want to integrate data from SAP and non-SAP sources—but how?"
- "We want to capture only the data that has changed since our last access for better performance—we don't need all the data extracted all over again."
- "Our business is moving faster. We need to be able to access R/3 data in real time."

A Long History of Leveraging SAP Data

Business Objects has a long history of helping companies derive business intelligence from SAP data. For more than seven years, Business Objects has maintained technological and marketing partnerships with SAP to devise customer-focused BI solutions.

In 1996, Business Objects was the first BI vendor accepted into SAP's Complementary Software Program, a formalized partnership. Since then, Business Objects has developed and licensed many products optimized specifically for SAP R/3, the mySAP Enterprise Portal, and the SAP BW environment. Business Objects is still a member of the SAP Software Partner Program and its products are SAP-certified.

In mid-2002, Business Objects reporting and analysis tools for SAP BW were highly rated among 13 vendors in an independent assessment conducted by the Business Application Research Center (BARC) Institute, a German consulting company with expertise in SAP. Business Objects scored high in data connectivity, portal integration, and overall functionality—ahead of competitors such as Cognos, Information Builders, and SAP's own interface to BW, Business Explorer. For more information on this report, please see:
http://www.businessobjects.com/news/press/press2002/barc_study.htm.

Notably, the Business Objects BI platform is fortified for SAP with BusinessObjects Data Integrator. This powerful extraction, transformation, and loading (ETL) platform was added to the Business Objects family with its purchase of Acta Technology in August 2002. The SAP-certified Data Integrator is renowned for its pioneering specialization in simplifying and automating the difficult processes of extracting and transforming data from SAP applications.

Tight integration between Business Objects and SAP technology enables a Business Objects solution to scale from a small, single-application deployment involving a handful of users, to one that encompasses multiple business units and hundreds or thousands of internal users, or external business partners.

The ERP/BI Lifecycle: An Evolution to Business Value

Though the benefits of applying BI against SAP data are clear enough, it's less clear which approach the enterprise should adopt to achieve its objectives. To determine strategy, it is useful to assess the existing IT infrastructure, end-user requirements, business unit objectives, and enterprise-wide objectives in context of what is called the ERP/BI lifecycle.

The four-phase ERP/BI lifecycle has proven valuable as a topography for the evolution of ERP from isolated transactional applications to a vital source of real-time business intelligence that is readily exploitable by users across the enterprise and beyond.

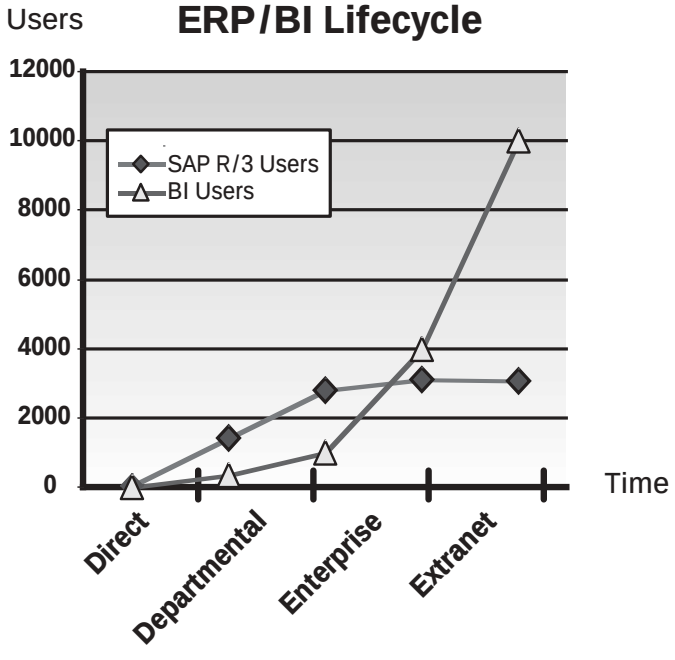
In determining which approach is best, an organization will wish to engage senior executives, business unit and IT managers, end users, and, in some cases, external business partners. Each of these stakeholders can provide input to ensure that a BI project is designed, implemented, and maintained in a manner that delivers the greatest ROI. The four phases are:

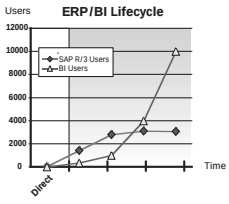
Phase 1: Direct Connection
Reporting Directly Against SAP Operational Data

Phase 2: Departmental Focus
Leveraging SAP for Enhanced Department-Specific Reporting and Analytics

Phase 3: Integrated Enterprise Analytics
Integrating SAP and Non-SAP Data for Enterprise Synchronization

Phase 4: Extended Access
Partner Collaboration for Competitive Advantage Through ERP/BI Extranets





Phase 1: Direct Connection

Reporting Directly Against SAP Operational Data

- **Existing IT infrastructure:** SAP application(s), typically not supported by BI infrastructure.
- **End-user requirements:** Rapid, localized, "light" reporting directly on high-level SAP data. Limited need to integrate data from cross-functional SAP or other applications. Relatively small number of users directly accessing the system; overnight or off-peak information delivery results in lag time.
- **Business unit objective:** Provide business unit users with some visibility into SAP data, without extensive engagement between IT staff and business users.
- **Enterprise objective:** Little to none, other than modest enhancement of discrete business or functional unit performance. Principally a tactical, "stepping-stone" solution.

Some organizations use built-in R/3 tools to generate reports on basic data points such as weekly inventory levels, customer lists, and financial roll-ups. With this approach, data is not moved into a data mart or data warehouse, but accessed in its resident application. However, it requires in-depth coordination among IT staff and business users to establish and maintain data definitions and configurations, as R/3 data tends to be classified in technical terminology of little relevance to the business user. Because the method involves a good deal of custom development, it is susceptible to inaccuracies and data quality problems.

▸ BusinessObjects Rapid Deployment Templates

Rather than use R/3 tools, many organizations take advantage of the enhanced query, reporting, and analysis capabilities of a BI tool—such as the BusinessObjects web-enabled full client or the WebIntelligence® thin client—to interact directly with data in the SAP application via BusinessObjects Rapid Deployment Templates™, or RDTs. BusinessObjects RDTs are a set of customizable Business Objects "universes" (the semantic layer that insulates users from data source complexity) and sample reports preconfigured for SAP applications. Each universe is a collection of predefined classes of objects that map data structures such as "Customers," "Orders," and "Materials" in terms meaningful to business users.

Because they are prebuilt, these RDTs minimize IT effort required for customized development, deployment, and administration. For the business user, they feature a drag-and-drop, one step query panel, and facility to combine information from disparate applications, relational databases, and desktop files. In combination, this provides the key advantages of greater accuracy and faster information deployment to the end-user community without a heavy IT overhead.

Limitations of the Direct Connection Approach

The impetus for direct connection using SAP or Business Objects products is usually a tactical—yet urgent—need to make basic SAP data useable by employees who are not SAP specialists. They may be considered strategic only because they represent a stepping stone to a broader SAP BI system that offers enhanced analytics to a greater number of users.

The principal criticism against the direct connection approach is the performance penalty that it can exact on the R/3 application. R/3 applications are not designed to support a large number of concurrent users in query and reporting. A complex query may require joining data from hundreds of R/3 tables, requiring IT involvement to ensure that the proper tables are accessed. Query times are typically slow, and application performance may degrade.

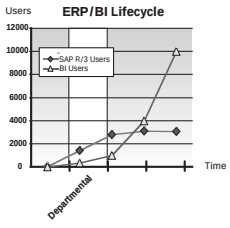
A second disadvantage is that direct connection typically restricts users to reporting on data in a single R/3 application. This approach is not geared for combined reporting on R/3 and non-R/3 data, and as a result, offers a myopic view of enterprise information.

Case Study: BOC Gases on BI Fast Track

BOC, a multinational supplier of industrial gases based in the U.K., did not want to wait to realize the value of BI. After implementing SAP R/3 to run its core transaction processing systems, BOC opted to jump-start its journey through the ERP/BI lifecycle with the direct connection approach powered by Business Objects.

In short order, BOC realized an ROI by endowing its sales force with the ability to rapidly generate reports that otherwise would have taken weeks, while exception reporting enabled BOC to highlight process control issues. At the same time, it avoided a large investment in custom ABAP code development to liberate R/3 data.

"Without Business Objects, you would need an army of ABAP programmers writing reports for people," commented Ian Hopgood of BOC at the time. Like many companies, BOC recognizes the limitations of the direct connection approach and is moving along the ERP/BI lifecycle to further drive value from SAP R/3.



Phase 2: Departmental Focus

Leveraging SAP for Enhanced Department-Specific Reporting and Analytics

- **Existing IT infrastructure:** Collection of SAP applications, typically supported by BI data marts specific to business or functional units.
- **End-user requirements:** Ad hoc query, reporting, and online analytical processing (OLAP) of data outside the SAP application among users in discrete business units. Utilize domain expertise, best-practice analytics, metrics, and alerts to maximize user experience. Some integration of non-SAP data.
- **Business unit objective:** Proactive monitoring and analysis of SAP data among a broad user base in discrete units to enhance unit performance. Equip knowledge workers with BI skill set. Deploy the data mart in a short timeframe, relative to the time it would take to roll out an enterprise data warehouse.
- **Enterprise objective:** Enhanced performance of business unit with measurable financial benefit. Groundwork laid among IT staff and business users to evolve toward next phase of integrated enterprise analytics.

Phase 2 of the ERP/BI lifecycle offers distinct advantages over the direct connection approach. This phase (as well as the remaining phases) involves moving SAP data into a data mart or warehouse designed for query, reporting, and analysis. As a result:

- Application performance problems are eliminated
- SAP and non-SAP data may be integrated into the data mart or warehouse
- Richer reporting and analytics are made broadly available to a non-technical audience

One objective of Phase 2 of the ERP/BI lifecycle is to build analytic solutions that optimize processes within a discrete business or functional area. As many organizations recognize, this optimization is not achieved overnight. Supply chain optimization, for one, is a discipline unto itself. Synchronizing demand planning, procurement, and manufacturing requires organizations to marshal large quantities of time-sensitive data from multiple, heterogeneous sources. For customer relationship management, aligning sales, marketing, customer behavior, and contact center data, this can be similarly challenging.

▸ Tactical Pieces in a Strategic Puzzle

A second objective of Phase 2 is continued development of a strategic plan for extending BI across the enterprise. Senior executives, IT and business managers, and end users should be engaged to identify data sources, define user requirements, articulate business unit and enterprise business objectives, and map a standardized BI architecture to scale from Phase 2 to Phases 3 and 4 (integrated enterprise analytics and extended access).

Many organizations need only survey their existing IT infrastructures to assess the pitfalls of tactical, one-off implementations of any technology, BI or otherwise. The intense deployment throughout the 1990s of web and application servers, databases, servers, development tools, and enterprise applications—on top of legacy systems—left many companies with a patchwork of

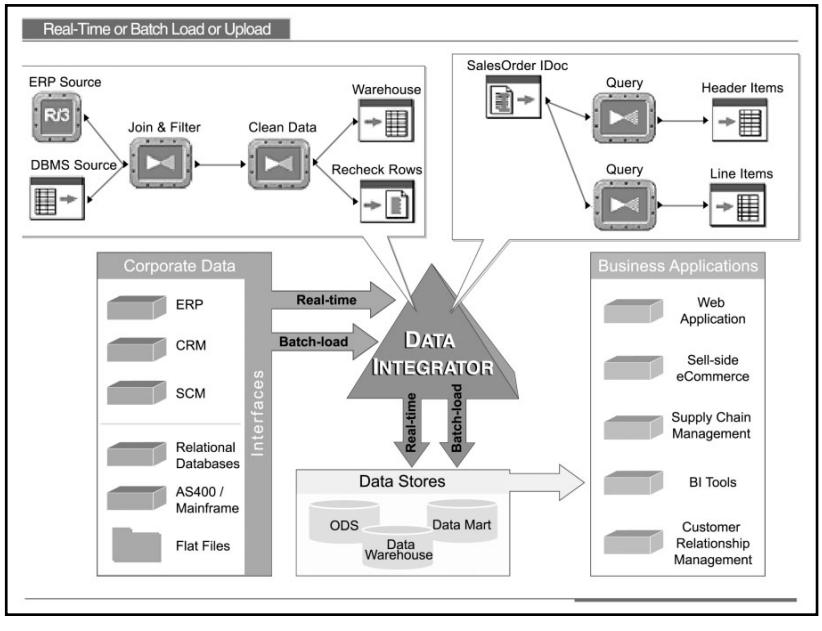
incompatible technologies. These disparate systems are costly to administer, difficult to maintain, and do not provide maximum business value.

In evolving through the ERP/BI lifecycle, companies will profit from a standardized BI framework. This approach minimizes IT costs, seamlessly accommodates new data sources and new users, and ensures users across the enterprise are working from the same page. Many companies have abundant opportunity to reverse past missteps as BI deployments continue to broaden. Despite rapid growth in the past 10 years, "BI penetration is relatively low, particularly in the U.S.," according to an October 2002 Gartner report.[4] In a Gartner survey, 66% of respondents said that BI penetration of the user community was between 1% and 24%.

Business Objects agrees with Gartner's recommendation: "Implementing BI tactically and in isolated pockets increases overall costs in the long run and ensures inconsistent perspectives from group to group. It also encourages the creation of stove piped view of customers, suppliers, and markets…enterprises should step back and view BI as critical to the entire enterprise, not just pockets."[5]

Packaged Data Marts: Rapid Time to Value

Business Objects enables IT staffs to accelerate time to value with its suite of packaged data marts that feature domain knowledge, prebuilt data models, transformation logic, and data flows for extracting data from SAP applications.



BusinessObjects Data Integrator provides a high performance ETL platform to leverage SAP and other enterprise data sources.

[4] Gartner COM-18-5218, "Business Intelligence, Strategic Intent/Tactical Deployment," H. Dresner, October 2002.
[5] Ibid.

These packaged data marts are based on the BusinessObjects Data Integrator ETL platform. They take advantage of its ability to automatically generate optimized ABAP code to extract data from SAP, drastically reducing development time and cost. They also minimize the burden on operational systems with changed data capture technology that extracts only data altered since the last ETL job, and advanced error recovery routines ensure that no data is lost or corrupted during processing.

The packaged data marts use a conformed dimension architecture that allows them to be implemented as stand-alone solutions, or as part of a modular approach to building a data warehouse. Their multi-threaded, parallel processing technology makes them uniquely suited to high-volume loads involving multiple, simultaneous jobs.

This technology also answers business needs to access and analyze a combination of SAP and non-SAP data. Besides SAP, the packaged data marts connect natively to applications from PeopleSoft, Oracle, J.D. Edwards, Siebel, and i2. Business Objects offers a range of packaged data marts in the areas of finance (profitability, accounts payable and receivable, general ledger, and cost center accounting), sales and distribution (sales, CRM, and logistics), supply chain management (inventory, purchasing, strategic sourcing, production planning, and plant maintenance), and human resources.

The SAP BW Alternative

In recent years, SAP has developed SAP BW to address the reporting gap that exists in its applications. SAP BW serves as a data mart or warehouse and will integrate data from disparate SAP applications. Third-party ETL tools, such as BusinessObjects Data Integrator, may supply it with data from SAP and non-SAP sources.

In its earliest iterations, SAP BW has been deployed mostly as a departmental BI solution in SAP-centric organizations—that is, the majority of the business unit's business applications are R/3. In some cases, SAP-centric business units have bypassed the direct connection phase of the ERP/BI lifecycle by using SAP BW.

As SAP has continued to enhance BW's functionality, it has emerged as an intriguing alternative for broader multi-unit and even enterprise-wide data warehousing in some organizations. SAP BW is the decided leader in the packaged data mart/warehouse market, with 55.9% of revenue, according to IDC. Though it is a small part of the larger $4.5 billion information access market, IDC expects the packaged data mart/warehouse category to grow at a 26% compound annual growth rate, to $962 million by 2006.[6]

[6] IDC, "Worldwide Information Access Tools forecast and Analysis, 2002-2006," May 2002.

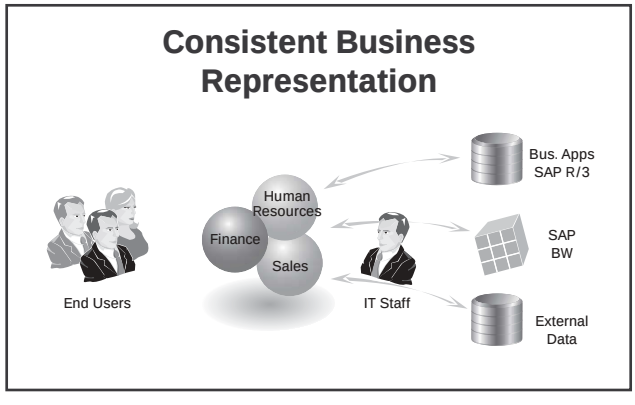
Many companies are weighing the pros and cons of SAP BW deployment as an ERP data warehouse (DW). In discussing ERP DWs, Gartner believes five scenarios may materialize:[7]

1. Use the ERP DW as the corporate DW.
2. Use a custom DW without an ERP DW.
3. Use the custom DW and the ERP DW as peers.
4. Have the custom DW feed the ERP DW.
5. Have the ERP DW feed the custom DW.

Organizations that deploy SAP BW in departments or across the enterprise can extend its value with a host of complementary products from Business Objects.

Among these value-add technologies is BusinessObjects BW Universe Builder. BW Universe Builder is a data access tool that provides full query and reporting from SAP BW via the BusinessObjects web-enabled full client or WebIntelligence thin client.

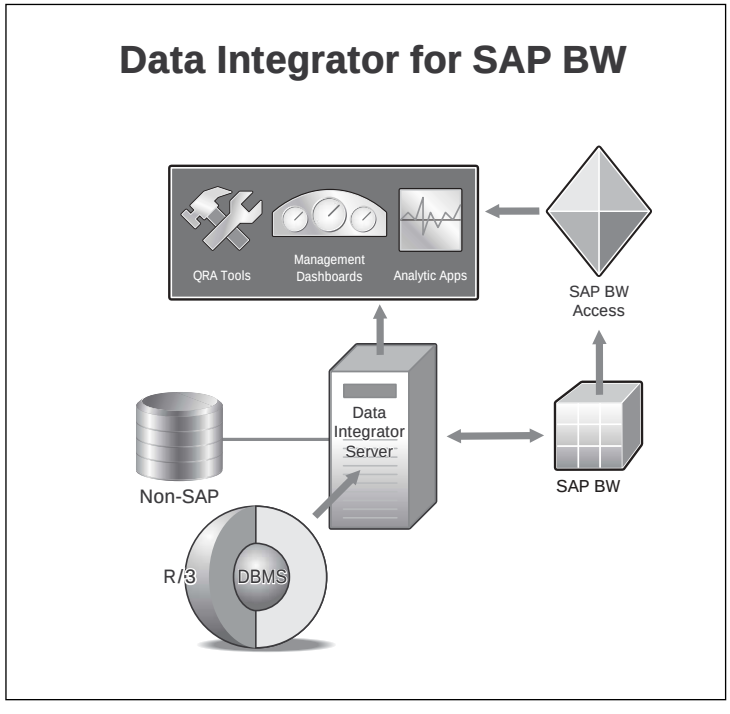
Business Objects also provides BW Connect, an SAP-certified interface to SAP BW that provides multidimensional (OLAP) analysis. This award-winning interface to the OLAP elements of SAP BW enables query, reporting, and analysis using Business Objects tools.



Business Objects provides flexible solutions that deliver a consistent representation of business data.

The BusinessObjects Data Integrator ETL platform, meanwhile, treats SAP BW as either a source or a target and provides real-time or batch movement without the need to write customized ABAP code. It provides extreme flexibility to making the most of R/3 and BW environments.

[7] Gartner DF-15-7517, "ERP Data Warehouse Implementation Strategies," T. Friedman and F. Buytendijk, April 2002.



BusinessObjects Data Integrator provides a flexible platform for routing data between sources and targets.

While SAP BW is proving to be attractive for SAP-centric organizations, many experts do issue caveats. Gartner cautions that organizations deploying ERP data warehouses such as SAP BW and competing PeopleSoft technology may encounter problems with flexibility and analyzing non-ERP data.[8]

META Group strikes a similar note in a November 2002 best practices assessment of SAP BW, as well as rival products from Oracle and PeopleSoft. According to META Group, large organizations should carefully assess the scalability of BI products from ERP vendors. "Most BI solutions for ERP, such as SAP Business Information Warehouse and Oracle Business Intelligence applications, were rushed to market. ERP vendors are increasing functionality and enhancing performance/scalability, but we believe they misjudged the difficulty of producing practical BI solutions. BI vendors have been honing their analytics for more than a decade, and ERP vendors are now playing catch-up."[9]

[8] Ibid.

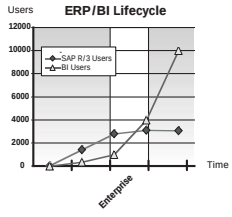
[9] META Group, "Business Intelligence Solutions for ERP Packages: Best Practices 2003/2004," November 2002.

Case Study: The Cutting Edge of Data Integration at Unilever

Unilever is a leading global producer of consumer packaged goods whose brands include Dove, Lynx, Flora, and Signal. The company needed to harness its large volume of data from disparate sources and make the data available for its global and regional offices.

Unilever has consolidated its data from diverse systems such as SAP, BPCS, and MFG Pro using BusinessObjects Data Integrator as an integration platform. Data Integrator comprises a data server, which can access multiple sources to intelligently manage and optimize the performance of an enterprise's data infrastructure. Data Integrator is complemented by BusinessObjects Rapid Marts™, prepackaged batch and real-time data movement and business logic for analytics and other data-intensive integration projects like CRM and supply chain management.

Unilever now has access to more relevant, accurate, and timely information across its corporate, regional, and local business units, and its operating companies. Steve Applegate, integration manager at Unilever, concludes, "Data Integrator has transformed what we were doing and how we were doing it."



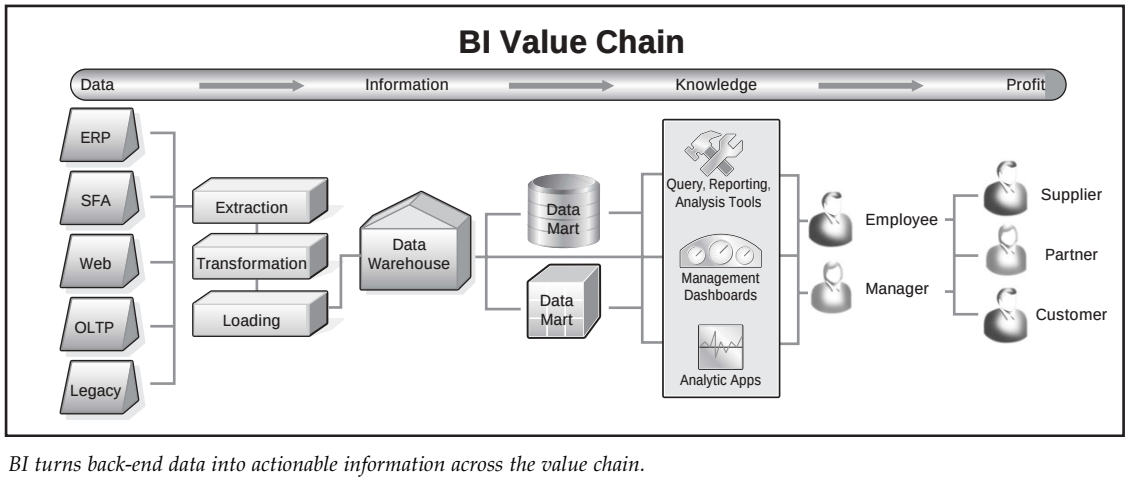
Phase 3: Integrated Enterprise Analytics

Integrating SAP and Non-SAP Data for Enterprise Synchronization

- **Existing IT infrastructure:** Complex application environment, including SAP and non-SAP applications—legacy systems, CRM, and e-commerce applications. This heterogeneous environment is typically supported by several data marts or enterprise data warehouses.
- **End-user requirements:** Advanced analytics across business processes, as well as query, reporting, and analysis (including OLAP) against data consolidated from multiple business and functional units (i.e., financials, supply chain, customer/product management, e-commerce). Ideally, standardized BI platform with access to and delivery of real-time data.
- **Business unit objective:** Enhanced performance with measurable financial benefit; solidify technological and business processes in concert with other operational divisions.
- **Enterprise objective:** Multi-level integration, reporting, and analysis of cross-organization SAP and non-SAP data to align business and functional areas and enhance overall enterprise performance; based on "one version of the truth."

Phase 3 assumes a broader and more complex scope than Phase 2. It evolves the ERP/BI deployment from a departmental focus toward integrated analytics that span multiple business and functional units.

It builds on the process optimization achieved in an individual area. In the example of the supply chain, this includes such processes as demand planning, strategic sourcing, manufacturing, logistics, inventory, and returns management. In Phase 3, the same principle is extended across the enterprise to synchronize among larger areas, including customer management, product management, supply chain, sales, marketing, and financials. Through cross-pollination of intelligence across business and functional units, an organization can derive insights to increase revenue, reduce costs, enhance productivity, and achieve a competitive advantage.



BI turns back-end data into actionable information across the value chain.

In this phase, SAP is rarely the sole source of data, though it is frequently a key source. Far more common is an array of enterprise and legacy applications, databases, e-commerce systems, and other data sources. Hence, the challenge faced by most organizations is to efficiently integrate SAP and non-SAP data and make it easily accessible to business users. Some characteristics of integrated enterprise analytics include:

- **Integration of complex disparate data**: Consolidates and normalizes data from enterprise and legacy applications, databases, e-commerce systems
- **Broad deployment**: Reporting and analytic capabilities are extended across the enterprise, from senior executives to departmental knowledge workers
- **Analytic breadth/depth**: Enhances user productivity with high-level metrics and best-practice analytics in personalized dashboards, while providing tools for basic reporting, and ad hoc query and multidimensional analysis of detail-level data
- **Standardized, flexible architecture**: Easily configured to deliver the right information to the right individuals, while providing consistent BI framework and interface to support same-page collaboration among units

Multiple, heterogeneous data sources and diverse requirements are common in this phase. To meet those challenges, the majority of experts recommend using a custom data warehouse, rather than ERP vendor-specific data warehouses such as SAP BW. As META Group put it: "For enterprise-strength analytics such as business performance management across multiple divisions and to employ diverse mega-application packages (e.g., organizations often have SAP for financials, PeopleSoft for HR, and Siebel for call centers), we recommend that staged data from the ERP or CRM package's integrated analytics be used to feed the enterprise DW (data warehouse)."[10]

Nonetheless, as SAP BW matures, more customers are likely to adopt it as an enterprise data warehouse standard, especially if they are standardizing deployment of SAP operational applications such as CRM, supply chain management, and financials. With more than 18,000 total customers, SAP claims to have sold BW to 2,700 customers, with 800 in production.[11]

Business Objects expects and welcomes growth in SAP BW adoption as it solidifies and harnesses diverse SAP applications into a single "capstone" readily enabled for BI by Business Objects. The Business Objects suite of BI connectivity and analysis tools for SAP BW will continue to support SAP BW customers with the widest range of choices to meet specific business requirements and user profiles.

▸ Integration of Complex, Disparate Data

Many organizations struggle to leverage their full range of data sources. This difficulty is particularly pronounced with SAP applications because of their proprietary nature, the complexities of ABAP programming, and difficulties in merging SAP and non-SAP data. Yet data integration is key to realizing the value of integrated enterprise analytics.

[10] META Group, "Business Intelligence Solutions for ERP Packages: Best Practices 2003/04," November 2002.
[11] RBC Capital Markets, "Analytics: Integration, Reporting, and Optimization," October 2002.

For instance, an organization may maintain procurement and production planning data in SAP R/3, and track sales and product management data in Oracle applications. Managers recognize that procurement and production planning processes are inefficient. Buyers are constantly challenged in purchasing the optimum quantity of raw materials. If they over-purchase, cash flow is disrupted and storage costs increase. If they under-purchase, manufacturing may not be able to meet demand.

These buyers are forced to rely on guesswork, because they have little visibility into downstream data. They interact only with SAP R/3 procurement and production planning applications—not the Oracle-based sales and product management systems. The objective of integrated enterprise analytics is to give these buyers real-time and historical insight into that sales and product management data to support intelligent, cost-effective purchasing decisions. It provides a standardized, collaborative environment to synchronize among related processes, that in the past had operated semi-autonomously.

The overarching premise of integrated enterprise analytics is to extend that same data-driven collaboration across the enterprise: sales informs procurement. CRM analytics drive product development. Marketing aligns with contact centers. And senior managers have ready visibility into all of the processes and data to enable the enterprise with the precision of a Swiss watch, based on a single version of the truth.

A powerful, multi-source ETL tool is a prerequisite to making integrated enterprise analytics a reality. BusinessObjects Data Integrator provides that robust functionality:

- More than 40 interfaces to applications, databases, technology standards, and mainframes including SAP, Oracle, Siebel, PeopleSoft, J.D. Edwards, IBM, XML, ODBC, and SOAP
- Renowned technical leadership in SAP; deep native integration includes browsing and importing from SAP's data dictionary, batch IDocs, access to pool tables, cluster tables, and hierarchies
- Code-free, graphical design environment to simplify and accelerate complex transformations of R/3 and non-SAP data
- Comprehensive metadata management, including centralized repository, web-based reporting, support for state-of-the-art metadata and XML standards
- A secure, multi-user, check-in/check-out environment, and centralized, web-based administration that supports simple network management protocol (SNMP)
- Dynamic creation and update of Business Objects universes from the design interface

▸ Broad Deployment

As noted by Gartner, penetration of BI among the universe of potential users remains relatively low, particularly in the U.S. At the same time, Gartner observes in its November 2002 report that a majority of the 540 U.S. and European IT and business professionals it surveyed recognize the business value of BI, and that 62% of companies interviewed will increase BI spending in 2003 and 2004.[12] For the time being, this under-penetration provides companies with a window of opportunity to broaden BI deployments to under-served audiences and achieve advantages that competitors lack.

Years ago, BI tools required some degree of technical sophistication, and as a result were used chiefly by specialized analysts. That has changed. BI vendors have focused on ease-of-use enhancements that make the tools a valuable asset to the non-technical business user. As the analyst firm Aberdeen Group observes: "BI tools have become exceptionally easy to use, administer, and leverage across large user populations."[13]

Business Objects has been at the forefront of this revolution. As the pioneer of patented "semantic layer" technology that shields end users from the complexity of underlying data schemas, Business Objects has become the leader in easy-to-use query, reporting, and OLAP tools that provide value across the organization.

The BusinessObjects web-enabled full client and the WebIntelligence thin client are uniquely suited to empower the workforce at all levels with query, reporting, and OLAP capabilities that are robust, yet easy to use.

For organizations deploying an enterprise portal, BI information can be readily presented on the user's desktop, without specific training via the integration of BusinessObjects InfoView with SAP's own Enterprise Portal products, or those of third-party portal vendors.

▸ Analytic Breadth/Depth

One of the key advances in BI technology in recent years has been the emergence of analytic applications. These applications are engineered explicitly for analytics by specific business and functional areas, with component-based modularity for interoperability across multiple units.

An analytic application is distinguished by a personalizable, web-based dashboard that features metrics and key performance indicators (KPIs). It will have built-in best practice analytics and domain expertise, and support exception reporting and alerts delivered via email and wireless devices to shorten decision cycles. The application will also provide drill-through and exploratory ad hoc analysis of granular data.

Component-based modularity among applications provides the basis for enterprise performance management, or EPM. EPM may be considered a flavor of integrated enterprise analytics, often built on a methodological, proactive framework such as Balanced Scorecard or Six Sigma, and which often emphasizes financial and budgeting processes.

12 Gartner COM-18-5218, "Business Intelligence, Strategic Intent/Tactical Deployment," H. Dresner, October 2002.
13 Aberdeen Group, "Business Objects: Raising the Bar on Itself with Analytic Applications," September 2002.

Whatever terminology is used, it's clear that companies are looking to data driven, cross-enterprise monitoring, measurement, and analytics to improve performance across the board. By Gartner's reckoning, less than 10% of large enterprises will have implemented CPM by year-end 2002; this adoption will increase to 40% by 2005 (0.7 probability).[14] (Gartner uses the term CPM, or corporate performance management, rather than EPM.) For many of these companies, a viable EPM solution will depend heavily on the ability to effectively leverage SAP data.

Business Objects provides a suite of four analytic applications including Customer Intelligence, Product and Service Intelligence, Supply Chain Intelligence, and Operations Intelligence. Comprised of 13 modules today, these analytic applications complement the operational functionality of SAP. In an assessment of BusinessObjects Analytics, Aberdeen Group concluded that the suite, "gives analytics-hungry enterprises, whether from the technology office or the business side of the house, a platform that rises above the value proposition of the individual piece parts."[15]

▸ Standardized, Flexible Architecture

Realizing maximum value from integrated enterprise analytics depends on consistent and sustainable information access. A BI framework shared across multiple units helps ensure collaboration among users—each individual is on the same page, and ability to access, analyze, and share information is greatly enhanced.

Many organizations, though, find themselves with stand-alone BI systems that are far from integrated. This comes about when BI needs are addressed on a project-by-project basis without considering the wider organizational impact. A piecemeal approach such as this can lead to a disjointed set of applications that become difficult and expensive to maintain.

Business Objects provides standardized analytics with BusinessObjects Application Foundation, the basis for BusinessObjects Analytics. This mid-tier framework for developing and deploying analytic applications uses a common enterprise data model that mediates between the business user and the technical data formats of enterprise applications such as SAP. Powerful analytic engines supply the horsepower for metrics analysis, business rules analysis, predictive analysis, set-based segmentation analysis, and statistical process control analysis.

▸ Case Study: Maxtor Gains Agility

Maxtor Corporation is very much aware of data—it is, after all, in the data business. With $3.8 billion in annual revenue and 11,000 employees, Maxtor is one of the world's largest suppliers of hard disk drive data storage products and solutions for consumers, professionals, and enterprise applications.

So when Maxtor replaced its legacy transaction environment with SAP R/3, it knew that it couldn't afford to let R/3 function simply as a nine-to-five operational workhorse. It needed to

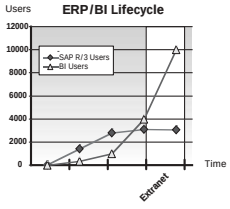
[14] Gartner: SPA 18-8766, "Put Corporate Performance Management to the Test in 2003," L. Geishecker and F. Buytendijk, December 2002.
[15] Aberdeen Group, "Business Objects: Raising the Bar on Itself with Analytic Applications," September 2002.

capitalize on its R/3 data with a BI solution that could deliver the analytic edge Maxtor needs to succeed in a highly competitive, 24/7 global marketplace.

Maxtor's first step was deployment of a Business Objects prebuilt data mart for sales, and the Business Objects front-end query and reporting tools. The packaged data mart, based on BusinessObjects Data Integrator, delivered rapid time to value by eliminating the need to write custom ABAP code to extract R/3 data and load it into the data mart. Through the Business Objects front end, Maxtor users gained visibility into sales, fulfillment, backlog, and shipping information for the first time that proved critical in enabling cost-effective efficiencies.

Maxtor has built on that success with the deployment of Business Objects BI front-end tools, Data Integrator, and packaged data marts spanning multiple departments and data sources, including SAP R/3 and i2, covering materials and manufacturing, finance, human resources, and other functions. The result: new global visibility into inventory, alignment between supply and demand, improved fulfillment using customer priority and fill-rate targets, and optimized utilization of manufacturing facilities. In short—agility.

"Agility is part of our core philosophy, and Business Objects is helping us to excel here by providing valuable insight into our business information," said Scott Hicar, Maxtor CIO and vice president of worldwide IT. "With best-of-breed technology from the data integration component to the business intelligence front end, Business Objects has enabled Maxtor to implement a powerful solution for delivering its enterprise information assets to all key decision makers and stakeholders."



Phase 4: Extended Access

Partner Collaboration for Competitive Advantage Through ERP/BI Extranets

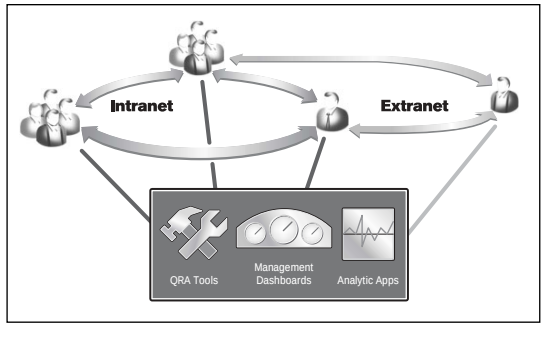
- **Existing IT infrastructure:** Collection of SAP applications, typically supported by data marts or enterprise data warehouse(s). Often, relevant non-SAP applications—legacy systems, e-commerce applications.
- **End-user requirements:** Supplier, customer, business partner access and reporting on near real-time transactional data.
- **Business unit objective:** Build better, more profitable relationships by offering partners the ability to monitor and measure business transactions over the web.
- **Enterprise objective:** Expand relationships with business partners across multiple units through differentiated value-add services, leading to reduced cycle times, volume discounts, and mutually beneficial collaboration.

As valuable as SAP applications have proven to be in streamlining internal financials, procurement, manufacturing, and logistics, the vast majority of companies have not been able to turn that value inside out. Very few effectively exploit SAP data to collaborate over an extranet with suppliers, customers, and business partners.

An informal survey that Forrester Research conducted of more than 500 IT and business professionals found that only 6% had configured ERP systems to be "very effective" for helping them collaborate with partners; 79% characterized their ERP systems as ineffective or only somewhat effective for supporting partner collaboration.[16] Typical challenges include multiple installations of ERP systems in different geographic locations, and the absence of a secure, web-enabled infrastructure and reporting tools necessary for partners to access internal data.

Yet these companies recognize the value in extending access to enterprise application data to business partners. Forrester's survey found that 65% percent of 26 manufacturing companies expected their ERP systems to support cross-company collaboration in 2003.[17] Key objectives include:

- Provide differentiated offerings that make your company more attractive as a business partner
- Give partners value-add ability to monitor, analyze, and report on transactional data over the web
- Optimize procurement through online sharing of demand plans, production forecasts, and capacity status
- Build mutually beneficial collaboration (i.e., shortened cycle times, precise pricing, and logistics)
- Achieve cost savings through reduced contact center calls and paper-based services



Dashboards that leverage SAP data can enable collaboration and knowledge sharing across the extended enterprise.

16 Forrester Research, "Firms Do Not Get Partnering Value from ERP," June 2001.
17 Ibid.

Leveraging BI for Value Chain Visibility

In Phase 4 of the ERP/BI lifecycle, a company builds on the BI foundation developed in Phase 2 and Phase 3. Much of the groundwork will already have been laid—an ETL platform that extracts data from SAP and loads it into a data mart or warehouse, and the deployment of end-user tools for query, reporting, and analysis. Deployment of an internal BI system before a BI extranet is often a good idea, because it enables companies to correct glitches and optimize functionality before deployment to a discriminating external audience.

A distinction should be made between an e-business extranet and a BI extranet. An e-business, or B2B, extranet should be viewed as a base-level system for exchange of static data such as invoices, purchase orders, order tracking, and delivery confirmation.

A BI extranet offers far greater value to customers, suppliers, and partners. It equips partners with query and reporting functionality to analyze data essential to their business. For instance, a supplier can analyze its sales over the past year to identify its top-selling products, average order volume, and seasonal demand spikes. These insights help a supplier to streamline its own procurement, manufacturing, and delivery mechanisms to realize cost savings that may well be passed on to buyer companies.

In large, multi-unit organizations, BI extranets also enable a supplier to identify cross- and up-sell opportunities that benefit both the buyer and seller through volume discounts and order consolidation. It provides visibility across the entire value chain and serves as a compelling point of differentiation for the company that offers it.

Business Objects: The Leader in BI Extranets

Business Objects has enjoyed tremendous success in helping companies deploy BI extranets. In fact, more companies rely on Business Objects for their extranet solutions than any other vendor.

A key component of the Business Objects extranet solution is WebIntelligence. This web-based thin client offers robust functionality to the external user, and at the same time is easily configurable by the host organization to ensure that external users access only the data they are authorized to see. WebIntelligence provides tight security through Windows NT authentication, firewalls, demilitarized zones (DMZs), secure sockets layer (SSL), and proxy servers.

Complementary products that enhance BI extranet value are BusinessObjects InfoView and BusinessObjects Broadcast Agent. InfoView is an enterprise BI portal that delivers customized content to external users, providing the sort of personal touch that can prove crucial in building intimate e-business relationships. InfoView also offers keyword searches, category classifications, and enables users to customize the interface to suit their needs. Broadcast Agent quickens the pulse of business processes through delivery of alerts through email, web, and wireless devices.

Case Studies: World Leaders in Risk Insurance and Medical Supplies Find Win-Win Solutions

With more than 750 extranet customers, Business Objects is the decided leader in supplying extranet BI solutions to companies large and small. Our extranet solutions have been deployed in a broad range of industries including financial services, telecom, utilities, manufacturing, electronics, health care, and others. Some examples include:

A leading risk insurance company, the third largest property-casualty insurer in the U.S. with 11,650 employees and $10.9 billion in premiums written in 2001, uses WebIntelligence to drive its innovative customer extranet. This extranet application provides the organization's risk management clients with secure online access to daily updates of claims and loss information. More than 100 template reports cover everything from detailed claim information to more comprehensive loss analysis to lag-time reporting—an enormous value-add that enables customers to analyze loss trends, review loss costs, and pinpoint problem claim areas early on. Through the BI extranet, the insurance company realized more than $400,000 in savings in the first year alone, as well as acquired and retained customers with a differentiated offering that capitalizes on information for business value.

Owens & Minor, a Virginia-based medical supplies distributor with nearly $4 billion in annual revenue, pioneered the use of BI extranets in the health care industry with a system it calls WISDOM, or WebIntelligence Supporting Decisions from Owens & Minor. The company uses WebIntelligence for a BI extranet that gives its hospital customers a global view of purchases, helping customers standardize products, consolidate suppliers, fine-tune inventory levels, and maintain contract compliance. Owens & Minor customers and supplier partners pay a nominal fee to use the system, and rely on it for real-time information crucial to cost-effective business. Through its award-winning BI extranet, Owens & Minor estimates it has bolstered its bottom line by at least $40 million in new business.

Conclusion

The marriage of SAP and other application data with business intelligence is a next step in the evolution of the intelligent enterprise. Smart businesses recognize that they cannot afford to allow transactional data to lie fallow, untilled for the analytic insights it would surely yield. As Forrester Research put it, "Turning information into insight will soon become a key success factor for companies of all stripes. Companies should begin by targeting analytical solutions that leverage their sunk investments in packaged apps like SAP and Siebel Systems."[18]

The good news is that in many organizations, the technological foundation for this marriage has been laid in the form of relatively mature implementations of SAP and other enterprise applications. How an organization pursues its BI strategy will vary by the requirements of its users, the complexity of its data sources, and the scope of its BI deployments.

Business Objects believes that the ERP/BI lifecycle provides a sound conceptual model for a phased approach that is based on strategic vision, yet delivers tactical dividends. The Business Objects product family supports the ERP/BI lifecycle—particularly SAP applications such as R/3 and BW—at every step of the way.

[18] Forrester Research, "Turning Data into Dollars," May 2001.

Americas
Business Objects Americas Inc
Tel : +1 408 953 6000
+1 800 527 0580

Australia
Business Objects Australia Pty Ltd
Tel : +612 9922 3049

Belgium
Business Objects BeLux SA/NV
Tel : +32 2 713 0777

Canada
Business Objects Canada Inc
Tel : +1 416 203 6055

France
Business Objects SA
Tel : +33 1 41 25 21 21

Germany
Business Objects Deutschland GmbH
Tel : +49 2203 91 52 0

Italy
Business Objects Italia SpA
Tel : +39 06 518 691

Japan
Business Objects Nihon BV
Tel : +81 3 5720 3570

Netherlands
Business Objects Nederland BV
Tel : +31 30 225 9000

Singapore
Business Objects Asia Pacific Pte Ltd
Tel : +65 6887 4228

Spain
Business Objects Ibérica SL
Tel : +34 91 766 87 43

Sweden
Business Objects Nordic AB
Tel : +46 8 508 962 00

Switzerland
Business Objects Switzerland SA
Tel : +41 56 483 40 50

United Kingdom
Business Objects (UK) Ltd
Tel : +44 1628 764 600

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